Revised Version

Fast Preview

Note: This is not exactly what the published abstract will look like

Photochemical Modeling of HO$_x$ in the Terrestrial Mesosphere and Comparison to OH Column Measurements from the JPL Table Mountain Facility

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OH column abundances and their diurnal variations have been measured from the JPL Table Mountain Facility since Aug 1997. Peak OH column abundances are found near local noon and a diurnal asymmetry is observed in which OH column abundances in the afternoon are typically larger than at the corresponding solar zenith angle in the morning. The largest noontime OH column abundances are found in summer and the smallest in winter. We are using the Caltech/JPL one-dimensional photochemical model (Allen et al. 1981) to examine the diurnal variations and to quantify the processes that are responsible for the observed behavior. Our first step has been to examine the sensitivity of the photochemical model to variations in selected input parameters. Based on these studies, we find the OH column abundance is most sensitive to changes in the concentrations of O$_3$ and H$_2$O, to changes in the photolysis rates of O$_3$ and H$_2$O, and to changes that affect the net rates for O(^{1}D) + H$_2$O $\rightarrow$ 2OH, OH + HO$_2$ $\rightarrow$ H$_2$O + O$_2$, and O + HO$_2$ $\rightarrow$ OH + O$_2$. The model has little sensitivity to changes in the concentrations of Cl$_y$, NO$_y$,CH$_4$, and CO. Other instruments have provided vertical profiles of O$_3$, temperature, and H$_2$O for the Table Mountain location at times that are coincident with some of the OH column abundance measurements. These data will be used as constraints on the diurnally-varying photochemical model calculations. Results from comparisons between the model calculations and OH column abundance measurements will be presented.

Meeting:
1999 AGU Fall Meeting

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Student rate:
Not Applicable

Willing to chair a session:

Meeting Section:
A - Atmospheric Sciences

Special Session:
A04 - HOx Dilemmas in the Middle Atmosphere

Index Terms:
300,317,340

Theme:

Material presented:
0%

Contributed

Poster presentation requested:

Scheduling request:
Please schedule this after the presentation by R.P. Cageao on Measurements of the OH Column Using a Fourier Transform Spectrometer at the JPL Table Mountain Facility Cageao's abstract submission is #5535